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Math 486 K01 Group Game

### **FractWards Game:**

*Retrieved and modified from*

[http://www.nctm.org/uploadedFiles/Conferences/Annual\\_Meetings/pdfs\\_for\\_jumpstarts/SarahNSarahMiddle.pdf](http://www.nctm.org/uploadedFiles/Conferences/Annual_Meetings/pdfs_for_jumpstarts/SarahNSarahMiddle.pdf)

### **Teaching Strategies/ Math Concepts:**

This is a great game that allows students to become more comfortable with fractions. This game can also be used for not only addition of fractions, but subtraction, multiplication, and division of fractions as well. The recording sheet allows for the teacher to assess the students and how well the game is going. This recording sheet may even reveal common errors amongst students and can be addressed after the game. Fractions are prevalent in all types of math and students tend to get bogged down when fractions are involved. This game is geared towards getting students excited about fractions while learning in the process.

### **Standard:**

7.NS.1.D. Apply properties of operations as strategies to add and subtract rational numbers.

### **Learning Target:**

I can create two fractions from four numbers and add them together to create a strategic move in the FractWards Game.

### **Academic Language discussion:**

Students will need to know equations, numerator, denominator, equivalent, fraction, and whole number. To develop academic language students will have a daily journal where they take vocabulary words, define them, and show examples of each. Also, I will have incorporated a word wall into my classroom where I would place academic language and the words that will build off of other words learned from previous lessons. Having a word wall is a great resource to use and refer back to while teaching.

**Scaffolding/Support:** Teacher will model game to class. Teacher gives step by step instructions. Teacher will monitor the room and offer support.

### **Special Needs:**

As said previously, this game can be directed around addition, subtraction, multiplication, and division. Also, it is a great hands-on activity for the kinesthetic learners. It is a social activity for the intrapersonal learners. It can also be turned into a

team activity where two students have the chance to work together and decide what combination of numbers may be their best move. See below for game modifications that will provide challenges for advanced students and assistance for struggling students.

**Materials:**

- 4 dice from template
- game board
- game directions
- recording sheets
- challenge questions
- anchor cards
- procedure cards
- up to 4 player tokens
- up to 4 different color coins that match the moving pieces

**Game Directions:**

1. On each turn, students will roll all four dice (provided). You can make any two fractions, using all numbers facing up as either numerators or denominators.
2. If you decide to make one of your fractions a whole number, you must make this number negative. The whole number cannot be positive.
3. Write these two fractions of your choice on the worksheet (provided), and add them.
4. Move forward the sum of your fractions, or backward if your result is negative. On the first round, since you are starting off of the board, you will find the sum on the Game Board (provided). For the following rounds, you will have to add the sum of fractions from the dice to your 'Old Spot' on the Game board. Hence, the last two columns on your worksheet. If you have to move so far back it takes you off of the board, consider yourself starting over and starting at zero again.
5. If you can create two equivalent fractions, you win another turn! Roll the dice again before passing the dice to your opponent.
6. If you get the same number on all of the four dice, you must move your piece to the beginning (zero) and start over.
7. If you land on one of the special icons (smile, heart, sun or cube), you must move to the matching icon. This will sometimes mean you advance, and sometimes mean you digress. So be clever in the fractions you create!

8. The winner is the player that gets to the end of the Game Board first. You do not have to land exactly on the last square (16) to win; your sum may take you past.

### **GAME MODIFICATION**

Additional Materials:

- Challenge question card
- Up to 4 different color coins that match the moving pieces

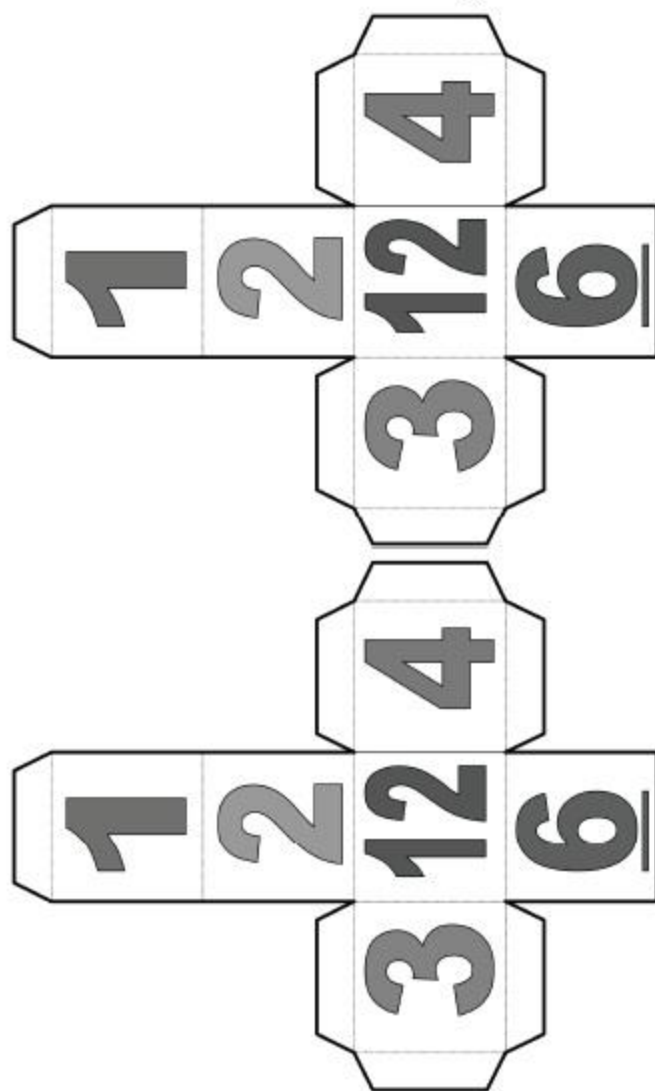
Procedures

- Each student who needs additional challenge will place a coin that matches their own moving piece on a position on another player's board.
- Proceed with the game as usual.
- As the players land on the places where the colored coins have been placed, the player whose color was landed on uses the challenge question card to assist the moving player to complete their turn.

Challenge Questions

- Flip the second fraction and add – record the work on the tracking worksheet
- Flip the second fraction and subtract – record the work on the tracking worksheet
- Flip the first fraction and add – record the work on the tracking worksheet
- Flip the first fraction and subtract – record the work on the tracking worksheet

# FractWards Dice Template



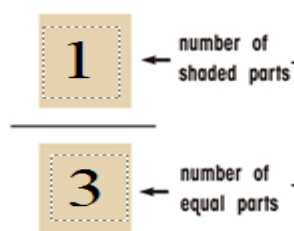
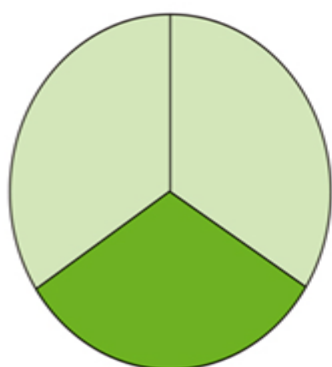
85/12 →	43/6 →	29/4 →	22/3 →	89/12 →	15/2 →	91/12 →	23/3 →	31/4 →	47/6 →	95/12 →	YOU WIN 😊
73/12 →	37/6 →	25/4 →	19/3 →	77/12 →	13/2 →	79/12 →	20/3 →	27/4 →	41/6 →	83/12 →	7
61/12 →	31/6 →	21/4 →	16/3 →	65/12 →	11/2 →	67/12 →	17/3 →	13/4 →	35/6 →	71/12 →	6
49/12 →	25/6 →	17/4 →	13/3 →	53/12 →	9/2 →	55/12 →	14/3 →	19/4 →	29/6 →	59/12 →	5
37/12 →	19/6 →	13/4 →	10/3 →	41/12 →	7/2 →	43/12 →	11/3 →	15/4 →	23/6 →	47/12 →	4
25/12 →	13/6 →	9/4 →	7/3 →	29/12 →	5/2 →	31/12 →	8/3 →	11/4 →	17/6 →	35/12 →	3
13/12 →	7/6 →	5/4 →	4/3 →	17/12 →	3/2 →	19/12 →	5/3 →	7/4 →	11/6 →	23/12 →	2
← START					😊						1
1/12 →	1/6 →	1/4 →	1/3 →	5/12 →	1/2 →	7/12 →	2/3 →	3/4 →	5/6 →	11/12 →	

## FractWards Student Recording Sheet

[illegible]

## ANCHOR CARDS

Fractions describe parts of a whole.



numerator

1 ← Numerator  
—  
2

the number of equal parts talked about; the number above the fraction bar

denominator

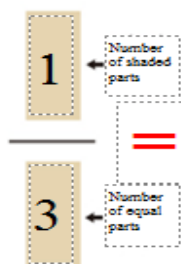
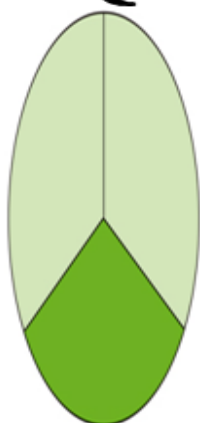
3  
4 ← Denominator

number of equal parts in the whole or set; the number below (DOWN) the fraction bar

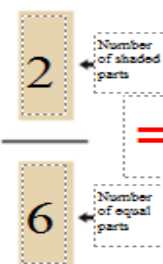
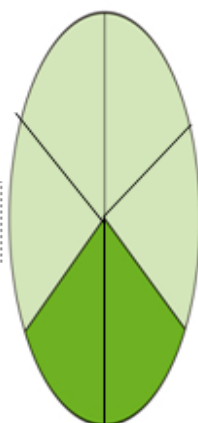
The whole has 1 shaded part(s).

The whole has 3 equal parts.

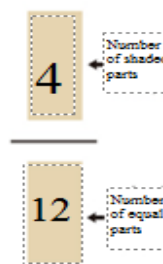
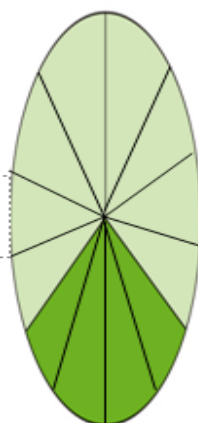
## EQUIVALENT FRACTIONS



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The whole has 1 shaded part(s).

The whole has 3 equal parts.

The whole has 2 shaded part(s).

The whole has 6 equal parts.

The whole has 4 shaded part(s).

The whole has 12 equal parts.

## PROCEDURE CARDS (*this would be created on a double sided card*)

### Adding Fractions

There are 3 Simple Steps to add fractions:

- Step 1: Make sure the bottom numbers (the denominators) are the same
- Step 2: Add the top numbers (the numerators), put the answer over the denominator.
- Step 3: Simplify the fraction (if needed).

**Example 1:**

$$\begin{array}{r} 1 \quad 1 \\ + \\ 4 \quad 4 \end{array}$$

**tep 1.** The bottom numbers (the denominators) are already the same.

Go straight to step 2.

**Step 2.** Add the top numbers and put the answer over the same denominator:

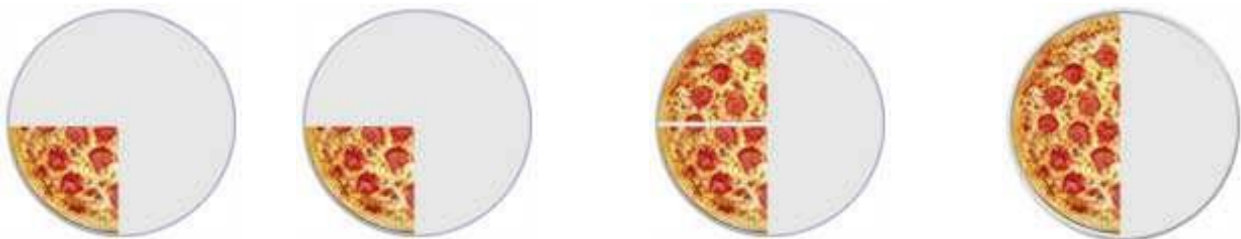
$$\begin{array}{r} 1 \quad 1 \quad 1 + 1 \quad 2 \\ + \quad = \quad = \\ 4 \quad 4 \quad 4 \quad 4 \end{array}$$

**Step 3.** Simplify the fraction:

$$\begin{array}{r} 2 \quad 1 \\ = \\ 4 \quad 2 \end{array}$$

In picture form it looks like this:

$$\frac{1}{4} \quad + \quad \frac{1}{4} \quad = \quad \frac{2}{4} \quad = \quad \frac{1}{2}$$



... and do you see how  $\frac{2}{4}$  is simpler as  $\frac{1}{2}$  ? (see [Equivalent Fractions](#).)



**Example 2:**

**Step 1:** The bottom numbers are different.  
See how the slices are different sizes?

$$\begin{array}{r} 1 \quad 1 \\ + \\ 3 \quad 6 \end{array}$$

$$\frac{1}{3} + \frac{1}{6} = ?$$



We need to make them the same before we can continue, because we **can't** add them like that.

The number "6" is twice as big as "3", so to make the bottom numbers the same we can multiply the top and bottom of the first fraction by **2**, like this:

$$\begin{array}{ccc} & \times 2 & \\ \text{1} & & 2 \\ & \text{=} & \\ \text{3} & & 6 \\ & \times 2 & \end{array}$$

Important: you multiply **both top and bottom** by the same amount, to keep the value of the fraction the same

Now the fractions have the same bottom number ("6"), and our question looks like this:

$$\frac{2}{6} + \frac{1}{6}$$



The bottom numbers are now the same, so we can go to step 2.

**Step 2:** Add the top numbers and put them over the same denominator:

$$\begin{array}{r} 2 \\ 6 \end{array} + \begin{array}{r} 1 \\ 6 \end{array} = \begin{array}{r} 2 + 1 \\ 6 \end{array} = \begin{array}{r} 3 \\ 6 \end{array}$$

In picture form it looks like this:

$$\frac{2}{6} + \frac{1}{6} = \frac{3}{6}$$



**Step 3:** Simplify the fraction:

$$\frac{3}{6} = \frac{1}{2}$$

In picture form the whole answer looks like this:

$$\frac{2}{6} + \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$$

